

Computer Networks (CSC-301)
Tribhuvan University
Institute of Science and Technology
Soch College of Information Technology

Course Title: Computer Networks

Course no: CSC-301----- Full Marks: 60+20+20

Credit hours: 3 ----- Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Discussion on types of networking techniques, Internet, IPV.

Goal: This course introduces concept of computer networking and discuss the different layers of networking model.

Course Contents:

Unit 1.----- 33 Hrs.

1.1 Computer Network: Introduction to networking, computer network, Internet, the network edge: end system, clients, server, connection oriented and connectionless service, network core, network access and physical media, ISPs and back bone.

1.2 Protocol Layers: Introduction, layered architecture, The Internet protocol stack, network entities and layers.

1.3 Application Layer: Introduction, principles of application layer protocols, the web and HTTP, file transfer, Domain Name Service [DNS]: Working of DNS, DNS records, DNS messages.

1.4 Transport Layer : Introduction, relationship between transport layer and network layer, transport layer in the Internet, multiplexing and demultiplexing, connectionless transport, reliable data transfer: Building a reliable data transfer protocol, pipelined reliable data transfer protocol, Go-Back-N (GBN), selective repeat (SR), connection oriented transport : TCP , TCP connection, TCP segment structure, time estimation and time out, flow control, Principle of congestion control: The causes and costs of congestion, approaches to congestion control.

1.5 Network Layer : Introduction, network service model, datagrams and virtual circuit service, routing principles: A link state routing algorithm, the distance vector routing algorithm, hierarchical routing, The Internet protocol (IP): IPV4 addressing, datagram format, IP datagram fragmentation, Internet Control Message Protocol [ICMP], Network address translator, routing in the Internet, IPV6, Multicasting routing.

Unit 2.----- 12 Hrs.

2.1 Link Layer and Local Area Networks: Introduction, Data link layer: the services provided by the link layer, error detection and error correction techniques, multiple access protocols, LAN addresses and Address Resolution Protocol, Ethernet, Wireless Links: IEEE 802.11b, Bluetooth, point to point protocol (PPP), Asynchronous Transfer Mode (ATM), frame relay.

2.2 Multimedia Networking: Introduction, multimedia networking application, streaming audio

and video.

2.3 Network Management: Introduction, The infrastructure for network management.

Laboratory works: Developing the network system in the small scale.

Text Books:

Computer Networking; A Top Down Approach Featuring The Internet, 2nd Edition, Kurose
James F., Ross W. Keith PEARSON EDUCATION ASIA